



2011 PENNSYLVANIA NATIONAL WEATHER SERVICE **FIRE WEATHER OPERATING PLAN**

[Updated February 9, 2011]

**** INTERNET VERSION ****

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I. PENNSYLVANIA FIRE WEATHER OPERATING PLAN

The Pennsylvania Fire Weather Operating Plan provides a guide for the National Weather Service (NWS) offices providing meteorological support for fire weather in Pennsylvania and for the Pennsylvania DCNR/Bureau of Forestry, Allegheny National Forest, Pennsylvania Game Commission, and other fire weather customers. Routine fire weather forecasts, Site Specific (SPOT) weather forecasts for wildfires and prescription burning planning forecasts, fire weather watches, red flag warnings, and on-site support are some of the information that federal, state, and local agencies receive and utilize.

II. FORECAST AREA RESPONSIBILITY

Fire Weather products and services are prepared and issued by the five NWS Weather Forecast Offices (WFO) serving Pennsylvania. These include WFO Cleveland, OH - CLE, WFO Pittsburgh, PA - PBZ, WFO Binghamton, NY - BGM, WFO Mt. Holly, NJ - PHI, and WFO State College, PA – CTP. For their respective county warning and forecast areas see Appendix A for a list and Appendix B for a map.

WFO State College, as the state liaison office (SLO) continues to be the NWS state-level representative with the Pennsylvania DCNR/Bureau of Forestry, Allegheny National Forest and Pennsylvania Game Commission.

The format of the Fire Weather Forecast (FWF) allows for a flexible (county/weather zone) header grouping coinciding with the county breakout/grouping of the Public Zone Weather Forecast Product (Ex: PHLZFPCTP) for the daily forecasts. Each weather county/zone is identified by its code and county name (i.e. PAZ003 - Crawford County).

III. COMMUNICATIONS

The current communication headers for the fire weather forecasts for PA are as follows:

FIRE WEATHER FORECAST

<u>OFFICE</u>	<u>9-letter ID</u>	<u>AWIPS</u>	<u>WMO</u>	<u>AREA</u>
WFO CLE -	CLEFWFCLE	FWFCLE	FNUS51 KCLE	Northwest PA
WFO PBZ -	PITFWFPIT	FWFPIT	FNUS51 KPBZ	Western PA
WFO BGM -	ALBFWFBGM	FWFBGM	FNUS51 KBGM	Northeast PA
WFO PHI -	PHLFWPHL	FWPHL	FNUS51 KPHI	Southeast PA
WFO CTP -	PHLFWFCTP	FWFCTP	FNUS51 KCTP	Central PA

FIRE WEATHER WATCH/ RED FLAG WARNING

<u>OFFICE</u>	<u>9-letter ID</u>	<u>AWIPS</u>	<u>WMO</u>	<u>AREA</u>
WFO CLE -	CLERFWCLE	RFWCLE	WWUS81 KCLE	Northwest PA

WFO PBZ - PITRFPWIT	RFPWIT	WWUS81 KPBZ	Western PA
WFO BGM - ALBRFWBGM	RFWBGM	WWUS81 KBGM	Northeast PA
WFO PHI - PHLRFPWPHL	RFPWPHL	WWUS81 KPHI	Southeast PA
WFO CTP - PHLRFPWCTP	RFPWCTP	WWUS81 KCTP	Central PA

Access to each of the five fire weather forecasts covering portions of Pennsylvania is available through several sources:

1. Daily by 7 AM year round on the following internet pages:

-NWS State College Internet homepage	http://www.weather.gov/statecollege
-National Fire Weather Page	http://fire.boi.noaa.gov

2. Transmitted on the NOAA weather wire system.

IV. FIRE SEASONS

In March of 2007, forest fire supervisors from the Pennsylvania Bureau of Forestry and Allegheny National Forest requested that the daily Fire Weather Forecast (FWF) be issued year-round, citing less seasonality to wildfire activity and the usefulness of the product in all months of the year. Therefore, the FWF product is now issued year-round by all offices serving Pennsylvania.

Prior to March 2007, the Pennsylvania fire weather forecast program was routinely activated in the Spring (March-May) and Fall (October-December) seasons. The exact dates for the beginning and ending of the issuance of the fire weather product was determined by the Bureau of Forestry in Harrisburg and the Allegheny National Forest and then coordinated with WFO CTP. WFO CTP notified the other supporting NWS offices

V. FIRE WEATHER FORECAST PRODUCT FORMAT

The fire weather forecast (FWF) products will be issued by 7 AM (usually 5 AM) daily for a 36-hour period of detailed forecast information accompanied by a general extended forecast up to 7 days. An 8 to 14 day outlook of whether general temperature and precipitation trends will be above, at, or below normal is appended to the end of the forecast product. The 36 hour forecast consists of three 12-hour periods (Today, Tonight, and Tomorrow).

The FWF contains appropriately grouped weather zone/county forecasts based on the daily forecast parameters in each NWS office area of responsibility in PA (see appendix C). These weather zones/counties may be grouped together differently with each daily forecast. However, the zone identification code (i.e. PAZ034 - Bedford) will always be associated with its assigned

county/zone. The symbol ">" means "through" so "033>036" includes the zones 033, 034, 035, and 036. Weather zones/counties in the fixed fire weather zones (WFO PHI) will remain the same on a daily basis.

The following is an example of the FWF:

FIRE WEATHER FORECAST FOR CENTRAL PENNSYLVANIA
NATIONAL WEATHER SERVICE STATE COLLEGE PA
426 AM EST MON DEC 8 2003

.RED FLAG...NONE.

.DISCUSSION...

HIGH PRESSURE WILL CONTINUE OVER THE STATE THROUGH TUESDAY.

PAZ004>006-010-011-091126-
WARREN-MCKEAN-POTTER-ELK-CAMERON-
INCLUDING THE CITY OF...BRADFORD
426 AM EST MON DEC 8 2003

.RED FLAG...NONE.

	TODAY	TONIGHT	TUE
CLOUD COVER	PCLDY	MCLDY	CLOUDY
PRECIP TYPE	NONE	NONE	NONE
CHANCE PRECIP (%)	0	0	0
TEMP (24H TREND)	33 (+10)	15 (+6)	46
RH % (24H TREND)	0 (-55)		
20FTWND-VAL/AM(MPH)	W 5		SE 9
20FTWND-RDG/PM(MPH)	NW 4	SE 4	SE 9
PRECIP AMOUNT	0.00	0.00	0.00
PRECIP DURATION	0	0	0
PRECIP BEGIN			
PRECIP END	8 PM	8 AM	8 PM
HAINES INDEX	4		
LAL	1	N/A	N/A
MIXING HGT(FT-AGL)			
DISPERSION			
TRANSPORT WND (KTS)	N/A	N/A	N/A
VENT RATE (KT-FT)			

REMARKS...NONE.

.FORECAST FOR DAYS 3 THROUGH 7...

.WEDNESDAY...A SLIGHT CHANCE OF LIGHT FREEZING RAIN AND CHANCE OF RAIN SHOWERS THEN RAIN LIKELY UNTIL EARLY EVENING. LOWS AROUND 30. HIGHS IN THE MID 40S. SOUTH WINDS 10 TO 20 MPH.

.THURSDAY...RAIN LIKELY THEN SCATTERED RAIN SHOWERS OR SNOW SHOWERS

UNTIL EARLY EVENING. LOWS IN THE LOWER 30S. HIGHS IN THE MID 30S. WEST WINDS 10 TO 20 MPH.

.FRIDAY...MOSTLY CLOUDY WITH SCATTERED SNOW SHOWERS. LOWS AROUND 19.

HIGHS IN THE UPPER 20S. NORTHWEST WINDS 5 TO 15 MPH.

.SATURDAY...MOSTLY CLOUDY WITH ISOLATED SNOW SHOWERS THEN PARTLY CLOUDY UNTIL EARLY EVENING. LOWS AROUND 19. HIGHS IN THE UPPER 20S. NORTHEAST WINDS 5 TO 10 MPH SHIFTING TO THE SOUTHEAST UNTIL EARLY EVENING.

.SUNDAY...A 20 PERCENT CHANCE OF SNOW UNTIL EARLY EVENING. PARTLY CLOUDY. LOWS AROUND 19. HIGHS IN THE UPPER 20S. SOUTHEAST WINDS 5 TO 10 MPH.

REMARKS...NONE.

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PAZ018-019-025>027-034>036-091126-
NORTHERN CENTRE-SOUTHERN CENTRE-BLAIR-HUNTINGDON- MIFFLIN-
BEDFORD-FULTON-FRANKLIN-
INCLUDING THE CITIES OF...STATE COLLEGE...ALTOONA
426 AM EST MON DEC 8 2003

.RED FLAG...NONE.

	TODAY	TONIGHT	TUE
CLOUD COVER	PCLDY	PCLDY	MCLDY
PRECIP TYPE	NONE	NONE	NONE
CHANCE PRECIP (%)	0	0	0
TEMP (24H TREND)	40 (+13)	19 (+4)	44
RH % (24H TREND)	0 (-50)		
20FTWND-VAL/AM(MPH)	NW 6		SE 5
20FTWND-RDG/PM(MPH)	NW 5	S 1	SE 5
PRECIP AMOUNT	0.00	0.00	0.00
PRECIP DURATION	0	0	0
PRECIP BEGIN			
PRECIP END	8 PM		8 PM

HAINES INDEX 4
LAL 1 N/A N/A
MIXING HGT(FT-AGL)
DISPERSION
TRANSPORT WND (KTS) N/A N/A N/A
VENT RATE (KT-FT)

REMARKS...NONE.

.FORECAST FOR DAYS 3 THROUGH 7...

.WEDNESDAY...A SLIGHT CHANCE OF LIGHT FREEZING RAIN AND CHANCE OF RAIN SHOWERS THEN RAIN LIKELY UNTIL EARLY EVENING. LOWS IN THE LOWER

30S. HIGHS IN THE MID 40S. SOUTHEAST WINDS AROUND 10 MPH INCREASING TO 10 TO 15 MPH UNTIL EARLY EVENING.

.THURSDAY...RAIN LIKELY THEN SCATTERED RAIN SHOWERS OR SNOW SHOWERS

UNTIL EARLY EVENING. LOWS IN THE MID 30S. HIGHS IN THE UPPER 30S. WEST WINDS 10 TO 15 MPH.

.FRIDAY...PARTLY CLOUDY. LOWS IN THE MID 20S. HIGHS IN THE MID 30S. NORTHWEST WINDS 5 TO 10 MPH.

.SATURDAY...PARTLY CLOUDY. LOWS IN THE LOWER 20S. HIGHS IN THE UPPER 30S. NORTHWEST WINDS AROUND 5 MPH SHIFTING TO THE SOUTHEAST UNTIL EARLY EVENING.

.SUNDAY...A 20 PERCENT CHANCE OF RAIN OR SNOW UNTIL EARLY EVENING. PARTLY CLOUDY. LOWS IN THE LOWER 20S. HIGHS IN THE UPPER 30S. SOUTHEAST WINDS 5 TO 10 MPH.

REMARKS...NONE.

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.OUTLOOK FOR DAYS 8 THROUGH 14...

VALID MONDAY DECEMBER 15 THROUGH SUNDAY DECEMBER 21

TEMPERATURE... NEAR NORMAL.

PRECIPITATION... NEAR NORMAL.

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VI. FIRE WEATHER FORECAST FORMAT EXPLANATION

SYNOPSIS/DISCUSSION - brief description of weather features affecting forecast for next 36 hours.

...HEADLINE... (used if a Fire Weather Watch or Red Flag Warning is in effect).

CLOUD AMOUNT - forecast sky cover - descriptive phrase

CHANCE PRECIP (%) - Probability of precipitation (POP) in percent

PRECIP TYPE - if POP 30 percent or higher - then precipitation description

MAX/MIN TEMPS - forecast temperature (F) for daytime maximum and nighttime minimum

WIND DIRECTION - average direction from which the wind is blowing

WIND SPEED MPH - average wind speed in mph

PRECIP AMOUNT - potential precipitation amount range in inches

PRECIP DURATION - expected precipitation duration in continuous hours

LIGHTNING FREQ - lightning frequency in range of strikes

REL HUMIDITY % - forecast relative humidity in percent for daytime minimum and nighttime maximum

MIXING HEIGHT - height above the surface (feet) through which relatively vigorous mixing will take place due to convection.

CEILING HEIGHT - when forecast cloud deck is greater than 50 percent, the height of the ceiling is listed in feet

HAINES INDEX - a stability index determined by combining the stability and moisture content of the lower atmosphere into a single number that correlates very well with large fire growth. Calculated near noon (18Z) for daytime and near midnight (06Z) for nighttime. Haines Index potential for large fire growth: *(2 or 3 very low, 4 low, 5 moderate, 6 high)*.

TRANSPORT DIR - average transport wind direction from surface to top of mixed layer.

TRANSPORT SPEED - average transport wind speed in mph from surface to top of mixed layer.

DISPERSION INDEX - smoke dispersion index values

DISP DESCRIPTOR - smoke dispersion description in categories - expressed in terms of mixing heights and transport winds. (POOR, FAIR, GOOD, VERY GOOD).

VENTILATION - value of the mixing height multiplied by the transport wind speed

VII. SPOT FORECASTS

Site-specific or “Spot” forecasts are issued by the National Weather Service in support of wildfire suppression and natural resource management. These forecasts aid the land management and fire control agencies in protecting life and property during wildland fires, hazardous fuels reduction, and rehabilitation and restoration of natural resources. Spot forecasts can be requested by government and emergency management officials for use in the control of wildfires, planning and conducting prescribed burns, as well as search and rescue operations, hazardous materials incidents, and other emergency situations where public safety is involved.

A Spot forecast will normally cover a 12-hour period and is produced by request. Agencies within the State College (CTP) county warning area are encouraged to request a spot forecast via our web site at the following internet address:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=ctp>

The use of **latitude and longitude** to describe the spot request location is strongly encouraged.

Spot forecast will be generated and sent to the web site where the request was generated.

If internet access is not available, the agency in need of a Spot fire weather forecast may telephone or fax the appropriate NWS forecast office with the warning responsibility for the county where the incident is located (see Appendix A). The forecast staff can then provide the information via fax or phone. See Appendix E for a fax version of the Spot Request Form.

Turn around time for Spot forecast requests is usually half an hour or less, however, higher priorities, such as severe weather, may delay the response until time permits.

The following information should be exchanged whenever a spot or pre-suppression forecast is requested:

THE REQUESTING AGENCY WILL PROVIDE THE FOLLOWING:
1) The name of the agency 2) Location (using latitude and longitude) and size of the fire 3) Elevation/Geography/Topography 4) Recent weather observations if any 5) Any additional information that would help the forecaster
THE FORECASTER WILL PROVIDE:

- 1) Time period for forecast (usually for 12 hours)
- 2) Brief synopsis
- 3) Relative humidity forecast (forecast min. value during the day and forecast max. value at night)
- 4) 20 ft forecast wind direction and speed (state height of wind if other than 20 ft)
- 5) Probability of precipitation
- 6) Mesoscale features associated with thunderstorms/fronts
- 7) Other weather phenomena deemed important by the forecaster

VIII. NFDRS POINT FORECASTS

The National Fire Danger Rating System (NFDRS) measures wildfire fire danger. The NWS role in NFDRS is that of forecasting weather parameters for input which when combined with fire weather community input (fuel moisture, etc) allows the NFDRS software to predict the next day's fire danger index. NWS State College is responsible for inputting weather parameters (PHLFWMCTP) into the National Fire Danger Rating Forecast. These forecast parameters are generally valid for the next day at 1300 LST, except some parameters (for example, max/min temperature and RH) are for a range of time. Updates are not required.

Per NWS Directives 10-401, a fire weather observation ***must*** be received for an NFDRS forecast to be generated. Forecast are generated daily for the nine (9) RAWs sites in State College's County Warning Area. These locations are as follows:

Bears Head, Schuylkill County
 Big Knob, Perry County
 Blair Helibase, Blair County
 Coffin Rock, Clinton County
 Garden Hollow, Centre County
 Kennedy Preserve, Clearfield County
 Kinzua, Warren County
 Old Mountain, Tioga County
 Wolf Pond, Dauphin County

The FWM Forecast format is as follows:

FCST,#####,YYMMDD,13,X,TT,RH,L1,L2,DD,SS,,TX,TN,RX,RN,P1,P2,F

where:

NFDRS Station Identifier {see above}

YYMMDD Year Month Day (**forecast valid date which is the next day**)

060608: June 8th, 2006

13 Time (forecast valid time 1300 hours/1PM EST) *Does not change.*

** The double comma “,” in the forecast line between SS and TX is needed to hold the

place for 10 hour fuel moisture values. The NWS does not forecast this however.
*The following parameters are valid at 1300 EST for the forecast valid **date (next day)**:*

X Weather

Codes: 0 - clear 5 - drizzle

1 - scattered clouds (mostly clear) 6 - rain

2 - broken clouds (partly-mostly cloudy) 7 - snow/sleet

3 - overcast 8 - showers

4 - fog 9 - thunderstorms

Note; categories 5, 6, or 7 sets NFDRS index to 0 Try to avoid.

TT Dry Bulb Temperature

RH Relative Humidity

DD Wind direction (N, NE, E, SE etc)

SS Wind speed (10 minute average in MPH)

L1 Lightning Activity Level (period 1300 - 2300 LST hours)

Codes: LAL Level Coverage (%) Descriptor

1 0 None

2 1-14 Isolated

3 15-24 Widely Scattered

4 25-54 Scattered

5 55+ Numerous

6 (Dry lightning) ≥ 15 Widely Scattered or greater (little/no rain)

L2 Lightning Activity Level (period 2300 - 2300 LST hours on forecast valid date)

The following parameters are valid for the 24 hour period ending at 1300 EST on the forecast valid date:

TX Maximum temperature

TN Minimum temperature

RX Maximum relative humidity

RN Minimum relative humidity

P1 Precipitation duration (1300-0500 LST period) in whole hours

P2 Precipitation duration (0500-1300 LST period) in whole hours

F Wet Flag "Y/N" (Only use Y for widespread rainfall. This will set all NFDRS indices to 0!)

Guidance products used to develop these forecasts include, but are not limited, to the following sources:

- Numerical MOS guidance for nearby stations,
- Fire weather observations (Observation is REQUIRED per Directive 10-401),
- Current METAR surface observations, and
- Satellite and Radar imagery.

IX. FIRE WEATHER WATCHES AND RED FLAG WARNINGS

Fire Weather Watches and Red Flag Warnings are used to convey the possibility of severe fire weather conditions to fire control agencies. NWS offices serving Pennsylvania began providing Fire Weather Watch and Red Flag Warning service as necessary to federal and state users in January 2000.

Red Flag events normally require the combination of very high to extreme fire danger and critical weather conditions, see below, (significantly increased winds and wind shifts, thunderstorm activity containing little or no rain, and significantly decreased humidity). The issuance of Red Flag events are based on the criteria of the users (state and federal) and require advance coordination.

The DCNR or Allegheny National Forest should notify the respective NWS forecast offices for areas where and when measured ten hour fuel moisture levels have dropped to 8 % or less.

Note: Meeting or exceeding the necessary criteria for Red Flag warnings due to lack of fuel moisture, low relative humidity, and strong winds is considered a *rare event* in Pennsylvania.

CRITERIA (must meet all 3)

- 1) Ten hour fuel moisture of 15% or less and is expected to remain at that level for 2 or more days...
- 2) Minimum relative humidity (RH) levels are expected to fall to 30% or lower...

AND (not 'or')

- 3) 20-ft winds sustained or frequently gusting at or above 20 mph for 2 or more hours.

--FIRE WEATHER WATCH--

A Fire Weather Watch is used to advise of the possible development of a Red Flag event in the near future. Usually fire danger is in the very high to extreme category. A Fire Weather Watch will normally be issued 12 to 24 hours in advance of the expected onset of severe fire weather conditions. The watch will be issued via an RFW product (i.e. RFWCTP). The product will contain a headline and the basis for the watch issuance. Fire Weather Watch information will be included in the affected areas of the daily routine Fire Weather Forecast. A Fire Weather Watch will be canceled via an RFW if subsequent information indicates that the conditions are no longer expected to develop.

--RED FLAG WARNING--

A Red Flag Warning is issued to indicate the imminent danger of severe fire weather conditions with a relatively high probability of occurrence. Usually the fire danger is in

the very high to extreme category. A Red Flag Warning will normally be issued for potential severe fire weather events in less than 12 hours. A Red Flag Warning may or may not be preceded by a Fire Weather Watch. The warning will be issued via an RFW product and contain a headline and basis for the warning issuance. Red Flag Warning information will be included in the affected areas of the daily routine Fire Weather Forecast. A Red Flag Warning will be canceled via an RFW if subsequent information indicates that the conditions are no longer expected to develop.

X. ON-SITE METEOROLOGICAL SUPPORT (ATMU)

Large wildfires may need an incident response. If the occasion should arise in Pennsylvania, then the state would request an AIR TRANSPORTABLE MOBILE UNIT (ATMU). This unit would be requested by the state or federal government through the U.S. Forest Service or NIFC. The local user agency requesting the on-site forecast service has the primary responsibility for transporting the ATMU and ATMU meteorologist to and from the incident.

XI. REFERENCES

- * Software - CAE Fire 3.3 - RDF-based program with national format
Jeff Linton, WFO Columbia, SC - September 2000
- * NDS Directive 10-4 (10-401 to 405) - Fire Weather Service Program
- * NDS Directive 10-401; Sect 4 - Fire Weather Watch/Red Flag Warning Program

XII. FIRE WEATHER PROGRAM CONTACTS

DCNR - PA BUREAU OF FORESTRY STATE CONTACTS

Department of Conservation and Natural Resources (DCNR),
Division of Forest Fire Protection, Bureau of Forestry
400 Market Street/Rachel Carson Office Building
P.O. BOX 8552
Harrisburg, PA
17105-8552

ALLEGHENY NATIONAL FOREST (ANF) CONTACTS (Northwest PA CTP/PBZ)

Allegheny National Forest
222 Liberty Street
P.O. Box 847
Warren, PA 16365

NATIONAL WEATHER SERVICE (NWS) INFORMATION

FWPL: Fire Weather Program Leader

MIC: Meteorologist-In-Charge

WCM: Warning Coordination Meteorologist

NWS field offices responsible for providing Pennsylvania Fire Weather Forecasts

WFO Mt. Holly, NJ (PHI)

Lee Robertson, FWPL lee.robertson@noaa.gov

Gary Szatkowski, Meteorologist In Charge (MIC)

Joe Miketta, Warning Coordination Meteorologist (WCM)

732 Woodlane Road

Mt. Holly, NJ 08060

WFO Binghamton, New York (BGM)

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Binghamton Regional Airport

32 Dawes Drive

Johnson City, NY 13790

WFO Pittsburgh, PA (PBZ)

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